

## SYNONYMY OF TWO GENERA OF CYNIPID GALL WASPS AND DESCRIPTION OF A NEW GENUS (HYMENOPTERA: CYNIPIDAE)

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*Abstract.*—The location and reexamination of the “lost” generatype of the cynipid genus *Xystoteras* Ashmead has made it possible to demonstrate that this genus is a junior synonym of *Phylloteras* Ashmead NEW SYNONYMY. Two species, *Phylloteras lyratum* NEW SPECIES and *P. primum* NEW SPECIES are described, and a key to the species of *Phylloteras* is included. *Euxystoteras campanulatum* NEW GENUS AND NEW SPECIES, is described and compared to other closely related genera.

*Key Words.*—Insecta, Cynipidae, unisexual female, monothlamous gall

Confusion has long existed as to the identities of two Ashmead genera: *Phylloteras* and *Xystoteras*. The type-species of *Phylloteras*, *Biorhiza rubinus* Gillette, 1888, was redescribed by Ashmead (1897a) as having toothed claws and 13-segmented antennae. The type-species of *Xystoteras*, *Xystoteras volutellae* Ashmead (1897b), was described as having simple claws and 14-segmented antennae. On the basis of these characters the genera could not be confirmed. In cynipid taxonomy, the presence or absence of a tooth on the tarsal claw is considered to be of fundamental importance in separating major genera of the group. Lewis Weld (personal communication) and others believed that Ashmead, in his description, had erred in stating that *X. volutellae* had simple claws because no other species in these closely related genera had simple claws. As a result, all of the described species in these genera were considered to have toothed claws and were separated only by the number of antennal segments.

When the William Beutenmuller collection of Cynipidae came to the National Museum of Natural History in 1935, the “missing” *X. volutellae* type was found. Ashmead’s label, host and host locality were on the pin, but it did not have a type label on it; I have examined this specimen and found that it agrees with the published description. However, a slide preparation, examined under high magnification, clearly shows the tarsal claws to be toothed. The antennae have 14 segments. I have concluded that this is the holotype and it has been so labeled. Study of a series of *Phylloteras rubinum* (Gillette) shows the number of antennal segments to be variable. Most specimens have 13 segments with the terminal segment at least  $1.5\times$  the length of the preceding segment. Some specimens, however, have 14 segments and the terminal segment slightly shorter than the preceding one. Therefore there no longer seems to be a valid reason to separate the two genera. *Xystoteras* (November 1897) is proposed as a junior synonym of *Phylloteras* (May 1897) NEW SYNONYMY. The concept of the genus must now be modified: wings absent or rudimentary; antennae with 13 or 14 segments; tarsal claws toothed; notauli absent or present only as traces; head massive, at least  $0.5\times$  as long as broad, broader than the mesosoma; gena broadened behind the eyes; metasoma compressed, knife-like, with all tergites visible along the dorsal margin, longer than the head and mesosoma combined. The following *Xystoteras*

species are transferred to *Phylloteras*: *X. nigrum* (Fitch), *X. poculum* (Weld), and *X. volutellae* (Ashmead).

Weld (1926), believing that the type of *Xystoteras volutellae* had been lost, erroneously designated a series of specimens, collected at Texarkana, Arkansas, on *Quercus lyrata* Walt as lectotypes (sic!). These were widely distributed to various museums. After he located the "lost" type, he (Weld 1952) acknowledged the error and stated that the specimens from Texarkana represented a new species that should be described. This was never done, however, so a description of this new species is provided here.

### PHYLLOTERAS

#### PHYLLOTERAS LYRATUM LYON NEW SPECIES

(Fig. 1)

*Types*.—Holotype female. Paratypes: 20 females, ARKANSAS. MILLER Co.: Texarkana, from galls on *Quercus lyrata* Walt, Oct 1917 emerged from rearing 19 Feb, 20 Mar, 23 May, 6 Apr, 14 & 21 Jun 1918. Holotype and 4 paratypes in National Museum of Natural History, Washington, D.C.; 4 paratypes in Natural History Museum of Los Angeles County.

*Description*.—Unisexual female. Black, fading in older specimens; antennae, legs and ventral spine brown. Head (Fig. 1D) massive; from above, more than  $0.5\times$  as long as broad, broader than mesosoma; gena broadened behind eyes, nearly as high as broad in frontal view (Fig. 1C), appearing nearly circular in outline; interocular space broader than high; malar space without a groove,  $0.33\times$  length of the eye; frons coarsely rugose with large, shallow punctures. Antennae with 14 segments. Scutum slightly longer than broad, smooth, shining, punctate anteriorly but without notauli; wing rudimentary but reaching nearly to end of scutellum (Fig. 1D). Scutellum rounded behind, pubescent, with deep roughened area across base; disk punctate, raised, appearing "humped" in side view,  $0.5\times$  length of mesoscutum. Metasoma (Fig. 1A) smooth, polished, all terga visible along dorsal curvature; compressed laterally, appearing knife-like beyond second tergum. Ventral spine long, slender, sparsely pubescent. Tarsal claw (Fig. 1B) with short tooth. Length 1.5–2.2 mm ( $\bar{x} = 1.8$  mm;  $n = 12$ ).

*Gall*.—(Fig. 1E) Tiny, 3.5 mm high, monothalamous gall, attached to undersides of leaf blades. Developing galls covered with white bloom during growth, but lost at maturity. Larval cell occupies gall base.

*Diagnosis*.—See Key

*Host*.—*Quercus lyrata* Walt.

*Etymology*.—This species is named after its host oak, *Quercus lyrata*.

*Material Examined*.—Type series.

#### PHYLLOTERAS PRINUM LYON NEW SPECIES

(Fig. 2)

*Types*.—Holotype female. Paratypes: 4 females, VIRGINIA. FAIRFAX Co.: East Falls Church, 17 Oct 1946, emerged from rearing cages 22 Jan 1948. Holotype and 1 paratype female in the U.S. National Museum of Natural History, Washington, D.C. Three paratypes in the Weld collection, which is in R. J. Lyon's possession.

*Description*.—Unisexual female. Ant-like, deep chocolate brown; head (Fig. 2D), massive, more than  $0.5\times$  as long as broad, wider than mesosoma; gena (Fig. 2C) slightly broadened behind eyes; interocular space broader than high and coriaceous; frons punctate; malar space slightly less than  $0.5\times$  length of eye, without groove; antennae with 13 or 14 segments; scutum as broad as long, smooth,

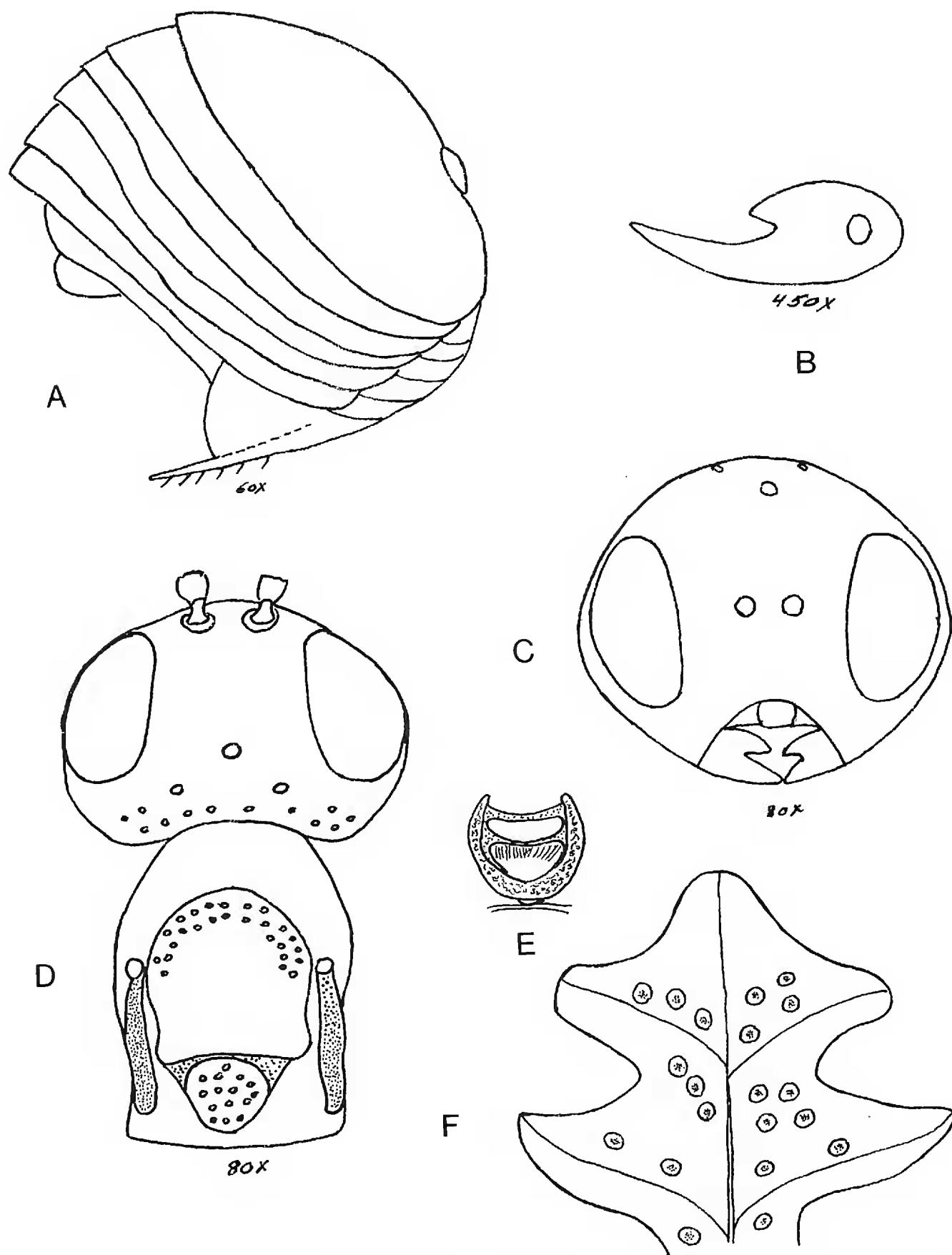


Figure 1. *Phylloteras lyratum* NEW SPECIES. A. Metasoma, lateral view, showing shape of terga. B. Tarsal claw with short tooth. C. Outline of head, frontal view. D. Head and mesosoma showing wing and scutum without notauli. E. Monothalamous gall showing position of larval cell. F. Leaf of *Q. lyrata* showing distribution of galls on leaf.

shining, without punctures or notauli but with indentations in position of lateral lines, posterior margin slightly emarginate; wings rudimentary, extending almost to end of scutellum (Fig. 2D); scutellum grooved at base, punctate, humped in side view,  $0.5\times$  length of mesoscutum. Metasoma (Fig. 2A), laterally compressed, knife-like, longer than head and mesosoma combined, all terga visible along dorsal curvature; tip of ovipositor hooked; ventral spine slender, bare; tarsal claws (Fig. 2B) strongly toothed. Length 1.45–2.2 mm ( $\bar{x} = 2.1$  mm;  $n = 5$ ).

*Gall.*—(Figs. 2E, 2F) Monothalamous, circular, flattened disk, 4 mm diameter, with depressed center.

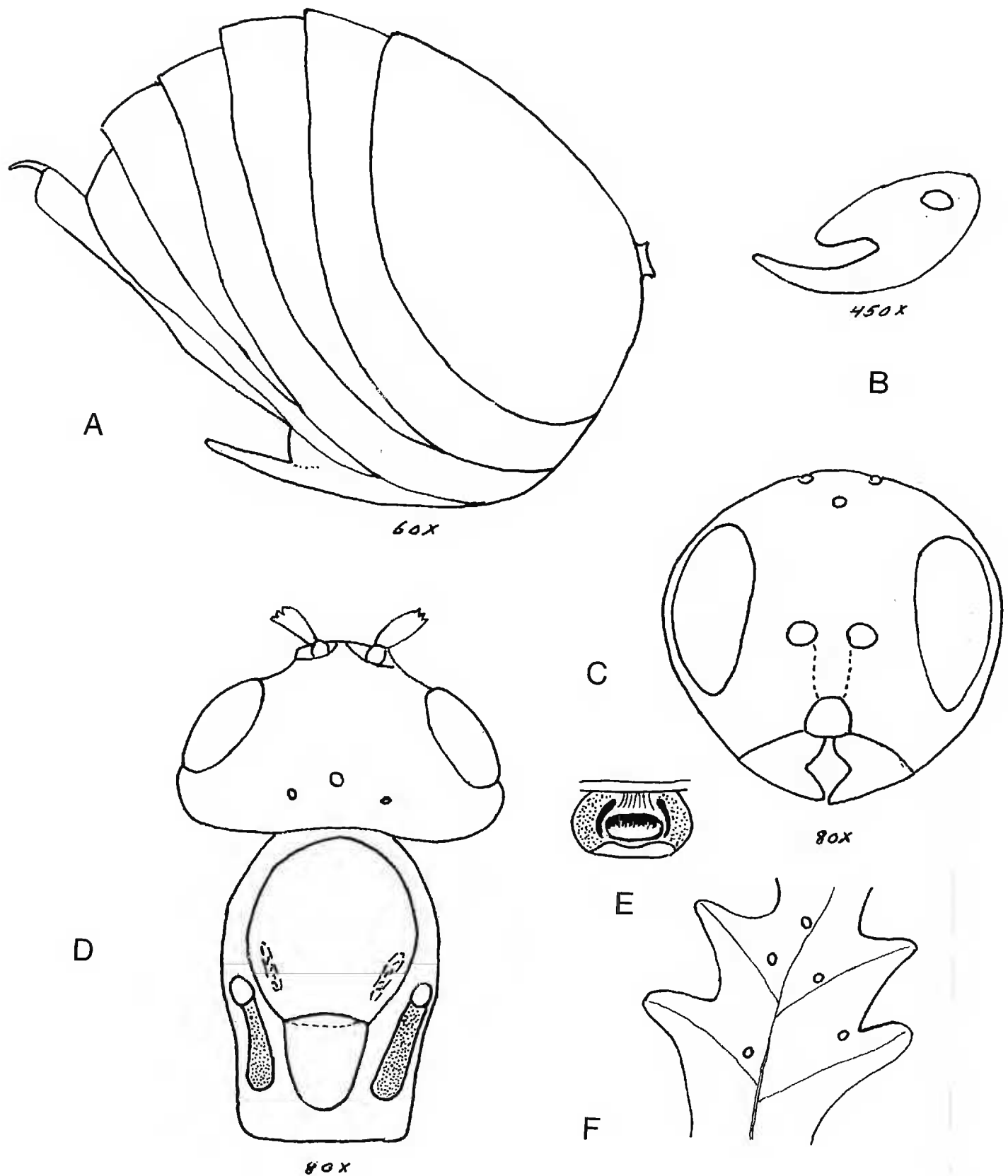


Figure 2. *Phylloteras prinum* NEW SPECIES. A. Metasoma, lateral view, showing shape of terga. B. Tarsal claw with long tooth. C. Outline of head, frontal view. D. Head and mesosoma showing rudimentary wing and lateral depressions on the scutum. E. Monothalamous gall showing position of larval cell. F. Leaf of *Q. prinus* showing distribution of galls.

*Larval Development.*—The insects were in the larval stage September 1946, but adults did not emerge until 22 Jan 1948.

*Diagnosis.*—See Key.

*Host.*—*Quercus prinus* L.

*Etymology.*—This species is named after its host oak.

*Material Examined.*—Type series.

KEY TO SPECIES OF *PHYLLOTERAS*

1. Wings<sup>1</sup> extending at least to middle of scutellum ..... 2
- Wings represented only by small pads ..... 5
- 2(1). Wings reaching to metasoma; scutum  $3 \times$  length of scutellum; scutum anteriorly deeply and conspicuously punctate. Small (3.5 mm) cylindrical galls on underside of leaf of *Quercus macrocarpa* Michaux (Kansas) ..... *P. volutellae* (Ashmead)
- Wings not reaching beyond scutellum; scutum less than  $3 \times$  length of scutum; scutum punctate or smooth ..... 3
- 3(2). Tarsal claws<sup>2</sup> with short tooth (Fig. 1B); scutum smooth, without traces of notauli or lateral grooves. Small (3.5 mm) cylindrical galls on undersides of leaves of *Quercus lyrata* (Arkansas) ..... *P. lyratum* Lyon
- Tarsal claws with long tooth (Fig. 2B); scutum with traces of notauli and/or with lateral grooves ..... 4
- 4(3). Scutum punctate anteriorly, faint notauli visible near center; scutellum punctate. Small (3.5 mm) depressed, spherical galls on underside of leaves of *Quercus alba* L. (Virginia) ..... *P. nigrum* (Fitch)
- Scutum and scutellum smooth, impunctate; no trace of notauli, but grooved laterally (Fig. 2D). Small (4.5 mm) circular spangles on the underside of leaves of *Quercus prinus* L. (Virginia) ..... *P. prinum* Lyon
- 5(1). Tarsal claw with long tooth; scutellum narrow in front, angled on sides and wider behind, with 2 small foveae at base. Depressed, spherical galls (2–3 mm) on underside of leaves of *Quercus alba* (Illinois, Missouri, New York and Virginia). ..... *P. rubinum* Gillette
- Tarsal claw with short tooth; scutellum not as above ..... 6
- 6(5). Mesonotum as long as broad, from above, circular in outline; scutellum equal in length to scutum; scutum smooth, without traces of notauli. Small (2.6 mm) cup spangles on underside of leaves of *Quercus arizonica*, *Q. grisea* and *Q. undulata* (Arizona and New Mexico) ..... *P. cupella* Weld
- Mesonotum longer than broad, not circular in outline; scutellum less than  $0.5 \times$  length of scutum ..... 7
- 7(6). Scutum  $3 \times$  length of scutellum; scutum and scutellum smooth, impunctate; head outline triangular in frontal view. Sigmoid-shaped galls on underside of leaves of *Quercus alba* L. (Maryland, New York, Virginia and District of Columbia) ..... *P. sigma* Weld
- Scutum  $2.5 \times$  length of scutellum; scutum and scutellum punctate; head oval in frontal view. Button-shaped spangles on underside of leaves of *Q. alba*, *Q. prinus* and *Q. prinoides* (Connecticut, Indiana, Kansas, Maryland, Missouri, New York, Virginia and District of Columbia) ..... *P. poculum* (Osten Sacken)

<sup>1</sup> Presence of rudimentary wings may be difficult to see because the wings are usually stuck to the body or encased in membrane.

<sup>2</sup> Tarsal claw traits should be determined with a compound microscope at  $350\text{--}450\times$ .

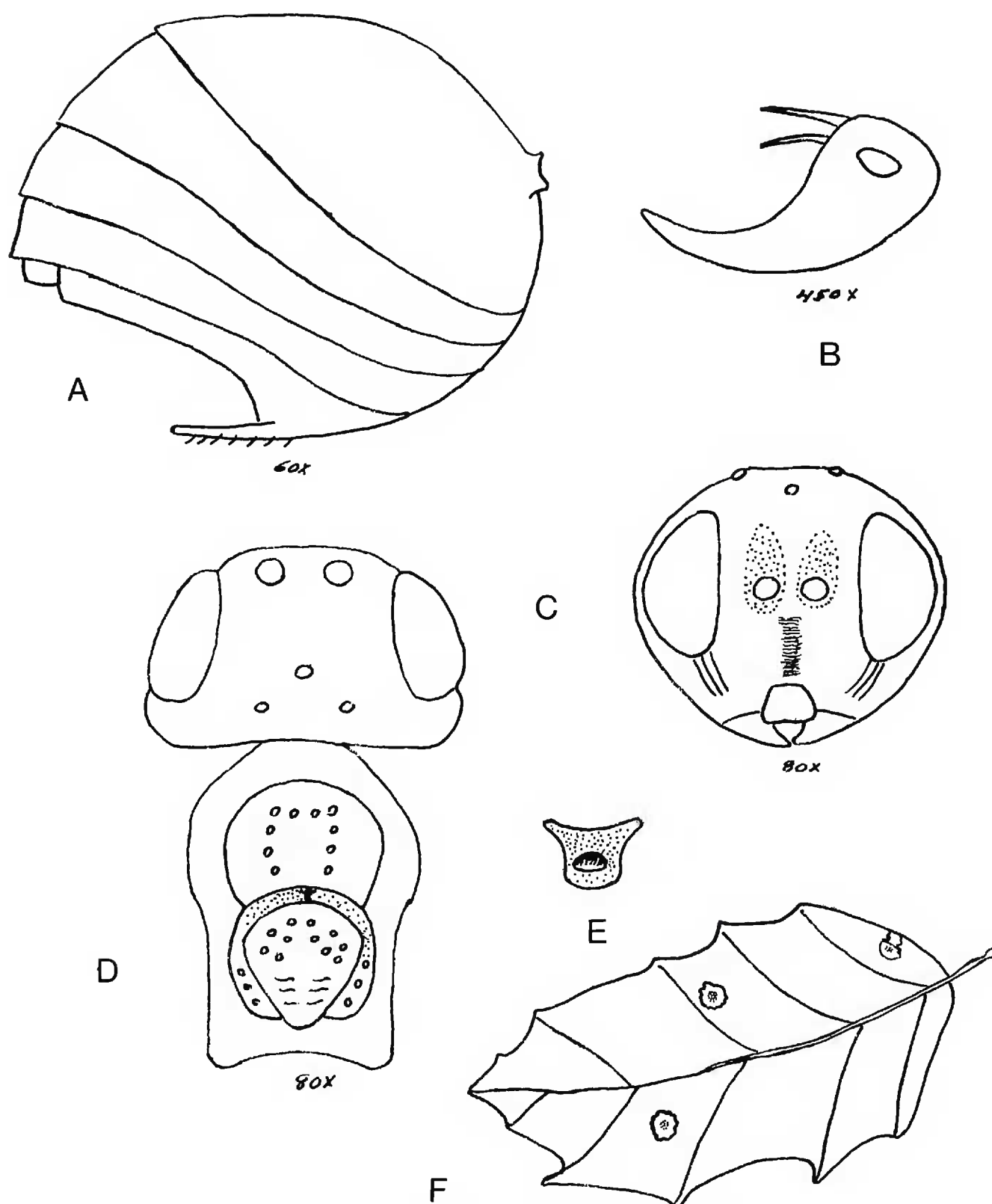


Figure 3. *Euxystoterus campanulatum* NEW SPECIES. A. Metasoma, lateral view, showing shape of terga. B. Simple (edentate) tarsal claw. C. Head, frontal view. D. Head and mesosoma showing punctate scutum and distinctive scutellar shape. E. Monothalamous gall, showing position of larval cell. F. Leaf of *Q. pungens* showing distribution of galls.

### *EUXYSTOTERAS* NEW GENUS

*Type-Species.* — *Euxystoterus campanulatum* Lyon NEW SPECIES

*Description.* — Generally similar to *Phylloterus* and *Zopheroterus* Ashmead 1897(b), except: tarsal claws simple; lacking knob-like scutellar process; distinct malar groove absent.

*Diagnosis.* — *Euxystoterus* is separable from *Phylloterus* by its simple tarsal claws. It is separable from *Zopheroterus* by its lack of a knobbed scutellum and a distinct malar groove.

*Material Examined.* — See *Euxystoterus campanulatum* NEW SPECIES.

*EUXYSTOTERA CAMPANULATUM* LYON NEW SPECIES

*Types*.—Holotype female. Paratypes: 19 females, TEXAS. *EL PASO Co.*: Franklin Mountains, El Paso, emerged from galls 21 Oct 1972. Holotype and 4 paratypes in the collection of the U.S. National Museum of Natural History, Washington, D.C. Four paratypes each in collections of the California Academy of Sciences and the Natural History Museum of Los Angeles County.

*Description*.—Unisexual female (Fig. 3). Wingless, ant-like, black, except dark brown legs; head massive (Fig. 3D), more than  $0.5\times$  as long as broad, broader than mesosoma; gena broadened behind eyes (Fig. 3C); interocular area  $2\times$  as wide as high and coriaceous; face sculptured, with numerous white bristles; two short convergent ridges extending from antennal sockets toward clypeus; malar space  $0.5\times$  length of eye, striate and with traces of furrow; antennae with 13 or 14 segments; scutum flattened (Fig. 3D), wider than long, with scattered bristles; notauli represented by several punctures; scutellum arrow-head shaped, separated from scutum by 2 comma-like curving pits extending toward median; bluntly pointed apex with sculptured ridges. Metasoma (Fig. 3A) higher than long, longer than head and mesosoma combined, all terga visible along dorsal curvature. Ventral spine slender, bare. Tarsal claws simple (Fig. 3B). Length 1.1–1.8 mm ( $\bar{x} = 1.55$  mm;  $n = 20$ ).

*Gall*.—(Figs. 3E, 3F) Small, campanulate cup, 5 mm diameter, 3 mm high; on lateral veins of upper and lower leaf surfaces. Monothalamous, larval cell occupying base. Appear in late summer as tiny, purple spangles that grow rapidly to reach maturity in October; mature galls red-brown; adults emerged 21 October.

*Diagnosis*.—This is the only species in the genus.

*Host*.—*Quercus pungens* Liebmann, an unusual little shrub oak that grows at elevations of 3500–6000 ft on limestone cliffs of mountains at scattered locations in Arizona, New Mexico and Texas. No cynipids or galls have previously been described from this oak. Lewis Weld, in his field notes, made frequent reference to it as a host oak; however, in later years, he (Weld 1960) indicated that he misidentified the oak and that his "*Quercus pungens*" was actually *Q. turbinella* Greene. A number of years ago, John Tucker, of the University of California at Davis, located specimens of this oak in the Franklin Mountains at El Paso, Texas, and indicated that an excellent opportunity to study the cynipid fauna existed. I have made periodic visits to these mountains since 1964 and have found that the oaks were abundantly "galled" with both described and undescribed species.

*Material Examined*.—Type series.

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